

REMARKS

Claims 1, 2, 4-21, 27-31, 38, 39, and 41 are pending in the application. In view of the present amendments and remarks, reconsideration of the application is respectfully requested.

STATUS OF THE CLAIMS

Claims pending: 1, 2, 4-21, 27-31, 38, 39, 41

Claims canceled: 3

Claims withdrawn from consideration: 27-31, 41

Claims amended: 1, 2, 4, 5, 11, 12, 27, 28, 38, 39, 41

Support for the claim amendments can be found in the Specification and original claims (see FIGS. 1-15, 17 and accompanying description). No new matter is being added.

As an initial matter, Applicant acknowledges that claims 15-17 have been indicated to be allowable if rewritten in independent form, and Applicant agrees that “Baumann fails to teach an auxiliary heat exchanger within the condenser.” See Office Action pg. 8.

1. The Claimed Invention.

Claim 1 has been amended to claim a method for removing non-condensing gas from a mixture of condensing and non-condensing gases in a condenser, comprising the steps of:

a) providing an auxiliary cooling surface in the condenser which is spaced for the main heat exchanging surfaces;

b) using the auxiliary cooling surface to provide within the condenser at least one cool region of gas in a mixture of condensing gas and non-condensing gases, wherein the gases in the cool region are at a temperature which is lower than the temperature of the gases in other regions of the condenser, and wherein the gases in the cool region comprise a high mass fraction of non-condensing gas when compared to the mass fraction of non-condensing gas in other regions of the condenser; and

c) withdrawing gas from said at least one cool region of gas.

Claim 2 has been amended to claim a condenser for condensing gas, with the condenser comprising:

a) a heat exchanging surface for condensing a condensing gas to a liquid;

b) cooling means spaced from the heat exchanging surface for producing a localized region of relatively cold gas, wherein the gas in the localized region of relatively cold gas is at a temperature which is lower than the temperature of gas in other regions within the condenser and which comprises a higher mass fraction on non-condensing gas; and

c) means for withdrawing gas from the localized region of relatively cold gas.

It can be seen from the above that claims 1 and 2 both require that the condenser have a cooling means spaced from the main heat exchanging surface which creates a region of relatively cold gas, and that non-condensed gas be withdrawn from that region of relatively cold gas.

2. The Cited Prior Art.

U.S. Patent No. 1,941,650 to Baumann has been cited as anticipating claims 1 and 2. Baumann '650 discloses a "single-pass" condenser of the type known for many years. As stated in the Baumann '650 patent, such condensers suffer from the disadvantage that the quantity of vapour condensed per unit area of cooling surface is much greater at the cooling fluid inlet than at the cooling fluid outlet because the cooling fluid is cooler at the inlet than at the outlet and "the temperature of the vapour to be cooled is approximately the same over the whole length of the condenser." See Baumann pg. 1, lines 11-16. Baumann improves the efficiency of such a compressor by dividing the vapour path into multiple streams and positioning the outlet for non-condensing gas at a location wherein the degree of condensation in each stream, and the temperature and air concentration at the end of each stream, is substantially the same. See Baumann pg. 1, lines 38-73.

3. The Differences Between the Claimed Invention and the Cited Prior Art.

One difference between the claimed invention and the condenser of Baumann is that the claimed condenser includes a separate cooling means that produces a region of relatively cold gas having a relatively high concentration of non-condensing gas. The Baumann condenser does not have any auxiliary cooling means that would provide a region of relatively cold gas having a high concentration of the non-condensing gas within the condenser. Instead, as stated by Baumann, "the temperature of the vapour to be cooled is approximately the same over the whole length of the condenser." See Baumann pg. 1, lines 14-16.

4. Claims 1 and 2 are Patentable Over Baumann.

Because Baumann does not teach applicant's claim limitations that the condenser must have a separate cooling means that produces a region of relatively cold gas having a relatively high mass fraction of non-condensing gas, and that non-condensed gas must be withdrawn from that region of relatively cold gas, the rejection under §102 should be withdrawn. Moreover, there is nothing in Baumann, either alone or when combined with the secondary reference that suggests that Baumann should be modified to include an auxiliary cooling means to provide a region of relatively cold gas, or that non-condensed gas should be withdrawn from that region of relatively cold gas. Rather, Baumann is seen to explicitly teach away from the intentional creation of any localized temperature variation within the condenser, since Baumann teaches that the temperature remains substantially same throughout the length of the condenser. Accordingly, a rejection under §103 would be improper as well.

It should also be noted that while claims 1 and 2 have been amended to more particularly point out and distinctly claim certain aspects of applicant's invention, the limitations that the condenser must have a region of relatively cold gas, and that non-condensed gas must be withdrawn from that region of relatively cold gas, were present in the claims examined by the Office.

Claims 38 and 39 have also been amended to specify an auxiliary cooling surface spaced from the main heat exchanging surfaces in the condenser. For reasons noted above, Baumann fails to teach or suggest the inclusion of an auxiliary cooling surface spaced from the main heat exchanging surfaces, and Baumann teaches away from using

any such auxiliary cooling surface to create a low temperature area in the condenser. Accordingly, the rejections of claims 38 and 39 are also seen to be improper.

5. Withdrawn claims

The withdrawn claims have been amended to better highlight their relationship to the common inventive concept, and Applicant respectfully requests reconsideration of the decision to withdraw claims 27-31 and 41 from further consideration in this application. None of the cited art is seen to teach or fairly suggest the creation of a localized cool region of gas with a high mass fraction of non-condensing gas nor the use of this localized cool region as a mechanism to reduce the mass fraction of non-condensing gas in other locations in a condensing system. The examined claims relate to application of this inventive concept to a condenser, wherein applicant has found that withdrawal of gas from the localized cool region is particularly effective in enhancing the performance of the condenser. However, the inventive concept can also be usefully applied to improve condensing effectiveness without any removal of gas from the localized cool region, and this application is particularly effective in condensing application, such as steam sterilizers and containment vessels, where gas removal is not warranted.

6. Conclusion.

The claimed invention has been shown to be patentable over the art of record. Favorable reconsideration of the application and all pending claims is respectfully requested. Applicant would welcome a telephone call from the Examiner to discuss any matters that would speed examination of this case.

Respectfully submitted,

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By /John M. Bradshaw, Reg. No. 46573/
John M. Bradshaw, Reg. No. 46573
Woodard, Emhardt, Moriarty, McNett & Henry LLP
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204-5137
Telephone: (317) 634-3456 Fax: (317) 637-7561
Email: jbradshaw@uspatent.com